MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2022/2023 (TERM ID 2210)

BQT1614 – QUANTITATIVE ANALYSIS

(All Sections/Groups)

10 FEBRUARY 2023
9.00 am – 12.00 pm
(3 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of **ELEVEN (11)** pages (excluding the cover page).

2. Answer **ALL** questions. The marks distributions are given in parentheses.

3. The Formulae Sheet and the Statistical Tables are provided.

QUESTION 1 [20 MARKS]

The closing stock prices is the price or cash value of the last transacted price in a security before the market officially closes for normal trading. The data below were presented as the closing stock prices of company XYZ for 15 consecutive days in January 2022:

127.50	126.30	128.85	130.10	129.65
125.95	127.90	129.40	128.70	135.10
126.80	131.10	129.65	128.85	128.80

a) Calculate the mean and median of the data. **[4 marks]**

b) Find the standard deviation and coefficient of variation of the data. **[4 marks]**

c) Calculate the first and third quartiles of the above data. **[6 marks]**

d) Find the 95% confidence interval for the proportion of closing stock prices more than 130. **[6 marks]**

QUESTION 2 [20 MARKS]

a) The probability that a randomly selected student from a college is a female is 0.55 and the probability of a student works more than 10 hours per week is 0.62. These events are independent thus find the probability,

i) a male college student and works more than 10 hours per week. **[2 marks]**

ii) a female college student or works more than 10 hours per week. **[2 marks]**

b) There are five people being considered for the position of CEO of Hugo Enterprises. Four of the applicants are over 60 years of age. Two are female, of which only one is over 60. Given that the person is over 60, what is the probability the person is female? **[4 marks]**

Continued...

c) In a certain week, a chartered accountant completes 85% of the checking and writing financial report in his company. Find the probability that in 10 random sample of financial reports, the number of completed checking and writing the reports, he will make is:

i) at most two. **[4 marks]**

ii) Find the mean and standard deviation of the completed checking and writing financial report. **[2 marks]**

d) ABC Corporation makes electric shavers. The life period during which a shaver does not need a major repair has a normal distribution with mean of 70 months and standard deviation of 8 months. Any shaver that needs a major repair during this warranty period will be replaced free by the corporation.

i) What is the probability which a shaver does not need a major repair if the life period less than 60 months? **[3 marks]**

ii) What should the warranty period be if the company does not want to replace more than 1% of the shavers? **[3 marks]**

Continued...

QUESTION 3 [20 MARKS]

a) The mean balance of all checking accounts at a bank was RM1050 in 2008. A random sample of 30 checking accounts taken recently from this bank gave a mean balance of RM910 with a standard deviation of RM230. Can you conclude that the mean balance of such accounts has decreased during this period at 5% significance level? **[8 marks]**

b) The management of a supermarket chain wanted to investigate if the percentages of men and women who prefer to buy national brand products are different. A sample of 600 men shoppers at the company's supermarket showed that 246 of them prefer to buy national brand products. Another sample of 700 women shoppers, showed that 266 of them prefer the national brand products. At 10% significance level, is there any significant difference between the proportions of men and women shoppers at these supermarkets who prefer to buy national brand products? **[12 marks]**

Continued...

QUESTION 4 [20 MARKS]

Mr. Oh would like to determine if the vehicle's weight can explain the vehicle's average fuel consumption. Thus, a random sample of 15 vehicles is selected and their average fuel consumption and weight are recorded in the following table:

Average fuel consumption (KM/litre)	Vehicle Weight (Kg)
18.2	1150
17.3	1200
17.5	1100
16.4	1340
15.5	1430
15.6	1500
15.5	1600
16.2	1550
16.8	1480
14.8	1720
14.3	1880
15.3	1620
18.2	1220
17.9	1230
15.3	1560

a) Identify the independent variable and the dependent variable

[2 marks]

b) Determine the equation of the regression line.

[6 marks]

c) What would happen to the average fuel consumption when weight is increased by 1 kg?

[2 marks]

d) Compute the coefficient of correlation and interpret its value.

[4 marks]

e) Compute the coefficient of determination and interpret its value.

[2 marks]

f) Determine the average fuel consumption of a 1380kg vehicle. Is the estimation reliable?

[4 marks]

Continued...

QUESTION 5 [20 MARKS]

a) A financial analyst has recommended two monthly savings plans to Jason, plan A and plan B. Plan A requires Jason to save RM750 per month and pays an interest of 5% per year compounded monthly. For plan B, Jason can decide the monthly savings amount and pays an interest of 4% per year compounded monthly. If Jason decided to choose Plan A, how much should he save in plan B at the end of each month so that both plans will give the same accumulated amount at the end of 5 years?

[5 marks]

b) How long will it take for an investment of RM1500 per quarter, which earns interest of 3.5% per year compounded quarterly, to accumulate the same amount as a 3-year investment of RM 30,000, which earns interest of 3% per year compounded monthly?

[6 marks]

c) James decided to get a t years loan of RM500,000 at 4% per year compounded monthly. Suppose James wants to pay back with a monthly payment of RM2500 per month, what is the value of t?

[4 marks]

d) The table below shows the prices and quantities of several sports' equipment used in a secondary school.

Item	2018		2021	
	Price (RM)	Quantity	Price (RM)	Quantity
Shuttlecocks	5	120	7	140
Basketball Hoop Net	30	24	32	28
Basketball	220	20	230	18
Football	180	25	195	26

i) Determine the Paasche price index for 2021 by using 2018 as the base year.

[2 marks]

ii) Determine the Laspeyres quantity index for 2021 by using 2018 as the base year.

[3 marks]

End of questions.

APPENDIXES:

I. STATISTICAL FORMULAE

A. DESRIPTIVE STATISTICS

Sample mean: $\bar{X} = \dfrac{\sum x}{n}$

Sample standard deviation: $S = \sqrt{\dfrac{\sum x^2}{n-1} - \dfrac{(\sum x)^2}{n(n-1)}}$

Coefficient of variation (sample): $CV = \dfrac{S}{\bar{X}} \times 100\%$

Pearson coefficient of skewness: $S_K = \dfrac{3(\bar{X} - Median)}{S}$

B. PROBABILITY

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$P(A \cap B) = P(A) \times P(B)$ if A and B are independent

$P(A \mid B) = P(A \cap B) \div P(B)$

Poisson Probability Distribution

If X follows a Poisson Distribution P (λ) where $P(X = x) = \dfrac{e^{-\lambda}\lambda^x}{x!}$

then the mean = E(X) = λ and variance = VAR(X) = λ

Binomial Probability Distribution

If X follows a Binomial Distribution B(n, p) where $P(X = x) = {}^nC_x p^x q^{n-x}$

then the mean = E(X) = np and variance = VAR(X) = npq where q = 1 - p

Normal Distribution

If X follows a Normal distribution N(μ , σ) where E(X) = μ and VAR(X) = σ^2

then $Z = \dfrac{X - \mu}{\sigma}$

C. CONFIDENCE INTERVAL ESTIMATION AN SAMPLE SIZE DETERMINATION

$(100 - \alpha)\%$ Confidence Interval for Population Mean:

If σ known, μ: $\bar{x} \pm Z_{\alpha/2} \dfrac{\sigma}{\sqrt{n}}$

If σ unknown, μ: $\bar{x} \pm t_{\alpha/2, n-1} \dfrac{s}{\sqrt{n}}$

$(100 - \alpha)\%$ Confidence Interval for Population Proportion, π: $p \pm Z_{\alpha/2}\sqrt{\dfrac{p(1-p)}{n}}$

Sample Size Determination for Population Mean: $n = \left(\dfrac{(Z_{\alpha/2})\ \sigma}{e}\right)^2$

Sample Size Determination for Population Proportion: $n = \dfrac{(Z_{\alpha/2})^2 \pi(1-\pi)}{e^2}$

Continued.....

D. HYPOTHESIS TESTING

One Sample Mean Test

***Z*-test:** $Z = \dfrac{\bar{x} - \mu}{\dfrac{\sigma}{\sqrt{n}}}$ ***t*-test:** $t = \dfrac{\bar{x} - \mu}{\dfrac{s}{\sqrt{n}}}$

One Sample Proportion Test

$$Z = \frac{p - \pi}{\sqrt{\dfrac{\pi(1-\pi)}{n}}}$$

Two Sample Mean Test

***Z*-test:** $Z = \dfrac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}}}$

***t*-test:** $t = \dfrac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{s_p\sqrt{\left(\dfrac{1}{n_1} + \dfrac{1}{n_2}\right)}}$ where $s_p = \sqrt{\dfrac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$

Two Sample Proportion Test

$$Z = \frac{(p_1 - p_2) - (\pi_1 - \pi_2)}{\sqrt{\bar{p}(1-\bar{p})\left[\dfrac{1}{n_1} + \dfrac{1}{n_2}\right]}} \quad \text{where} \quad \bar{p} = \frac{x_1 + x_2}{n_1 + n_2}; \quad p_1 = \frac{x_1}{n_1}; \quad p_2 = \frac{x_2}{n_2}$$

E. REGRESSION ANALYSIS

Simple Linear Regression

$y_i = b_0 + b_1 x_i$ where $b_0 = \bar{Y} - b_1\bar{X}$ and $b_1 = \dfrac{\Sigma XY - \left[\dfrac{\Sigma X \Sigma Y}{n}\right]}{\left[\Sigma X^2 - \left(\dfrac{(\Sigma X)^2}{n}\right)\right]}$

ANOVA Table for Regression

Source	Degrees of Freedom	Sum of Squares	Mean Squares
Regression	*1*	SSR	MSR = SSR/1
Error/Residual	$n-2$	SSE	MSE = SSE/($n-2$)
Total	$n-1$	SST	

Test Statistic for Significance of the Predictor Variable

$t_i = \dfrac{b_i}{S_{b_i}}$ and the critical value = $\pm t_{\alpha/2,(n-p-1)}$

where p = number of predictor

Continued.....

F. INDEX NUMBERS

Simple Price Index $P = \frac{p_t}{p_0} \times 100$	**Simple Aggregate Price Index** $P = \frac{\sum p_t}{\sum p_0} \times 100$
Laspeyres Quantity Index $P = \frac{\sum p_0 q_t}{\sum p_0 q_0} \times 100$	**Paasche Quantity Index** $P = \frac{\sum p_t q_t}{\sum p_t q_0} \times 100$
Laspeyres Price Index $P = \frac{\sum p_t q_0}{\sum p_0 q_0} \times 100$	**Paasche Price Index** $P = \frac{\sum p_t q_t}{\sum p_0 q_t} \times 100$
Fisher's Ideal Price Index $\sqrt{(Laspeyres\ Price\ Index)(Paasche\ Price\ Index)}$	**Value Index** $V = \frac{\sum p_t q_t}{\sum p_0 q_0} \times 100$

G. FINANCIAL MATHEMATICS

Simple Interest

Interest: $I = \Pr t$

Accumulated amount: $A = P(1+rt)$

Compounded Interest

Accumulated amount: $A = P(1+i)^n$

Present Value: $P = A(1+i)^{-n}$

Interest: $I = P(1+i)^n - P$

Effective rate of interest

$r_e = \left(1 + \frac{r}{m}\right)^m - 1$

Sinking Fund $R = \left[\frac{Si}{(1+i)^n - 1}\right]$	**Amortization** $R = \left[\frac{Pi}{1-(1+i)^{-n}}\right]$
Future Value of an Annuity $A = R\left[\frac{(1+i)^n - 1}{i}\right]$	**Present Value of an Annuity** $P = R\left[\frac{1-(1+i)^{-n}}{i}\right]$

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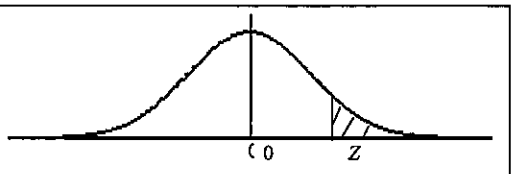
II. STATISTICAL TABLE

Table 1

The Upper Tail Area Under the Standard Normal Curve



Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010
3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007
3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003
3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
3.5	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
3.6	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
3.7	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
3.8	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
3.9	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

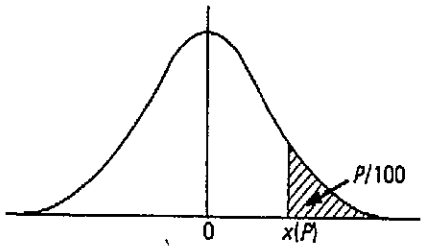
Continued.....

TABLE 5. PERCENTAGE POINTS OF THE NORMAL DISTRIBUTION

This table gives percentage points $x(P)$ defined by the equation

$$\frac{P}{100} = \frac{1}{\sqrt{2\pi}} \int_{x(P)}^{\infty} e^{-\frac{1}{2}t^2}\, dt.$$

If X is a variable, normally distributed with zero mean and unit variance, $P/100$ is the probability that $X \geqslant x(P)$. The lower P per cent points are given by symmetry as $-x(P)$, and the probability that $|X| \geqslant x(P)$ is $2P/100$.



P	$x(P)$	P	$x(P)$	P	$x(P)$	P	$x(P)$	P	$x(P)$	P	$x(P)$
50	0·0000	5·0	1·6449	3·0	1·8808	2·0	2·0537	1·0	2·3263	0·10	3·0902
45	0·1257	4·8	1·6646	2·9	1·8957	1·9	2·0749	0·9	2·3656	0·09	3·1214
40	0·2533	4·6	1·6849	2·8	1·9110	1·8	2·0969	0·8	2·4089	0·08	3·1559
35	0·3853	4·4	1·7060	2·7	1·9268	1·7	2·1201	0·7	2·4573	0·07	3·1947
30	0·5244	4·2	1·7279	2·6	1·9431	1·6	2·1444	0·6	2·5121	0·06	3·2389
25	0·6745	4·0	1·7507	2·5	1·9600	1·5	2·1701	0·5	2·5758	0·05	3·2905
20	0·8416	3·8	1·7744	2·4	1·9774	1·4	2·1973	0·4	2·6521	0·01	3·7190
15	1·0364	3·6	1·7991	2·3	1·9954	1·3	2·2262	0·3	2·7478	0·005	3·8906
10	1·2816	3·4	1·8250	2·2	2·0141	1·2	2·2571	0·2	2·8782	0·001	4·2649
5	1·6449	3·2	1·8522	2·1	2·0335	1·1	2·2904	0·1	3·0902	0·0005	4·4172

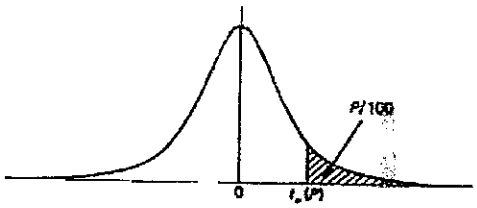
Continued.....

TABLE 10. PERCENTAGE POINTS OF THE t-DISTRIBUTION

This table gives percentage points $t_\nu(P)$ defined by the equation

$$\frac{P}{100} = \frac{1}{\sqrt{\nu\pi}} \frac{\Gamma(\frac{1}{2}\nu+\frac{1}{2})}{\Gamma(\frac{1}{2}\nu)} \int_{t_\nu(P)}^{\infty} \frac{dt}{(1+t^2/\nu)^{\frac{1}{2}(\nu+1)}}.$$

Let X_1 and X_2 be independent random variables having a normal distribution with zero mean and unit variance and a χ^2-distribution with ν degrees of freedom respectively; then $t = X_1/\sqrt{X_2/\nu}$ has Student's t-distribution with ν degrees of freedom, and the probability that $t \geqslant t_\nu(P)$ is $P/100$. The lower percentage points are given by symmetry as $-t_\nu(P)$, and the probability that $|t| \geqslant t_\nu(P)$ is $2P/100$.



The limiting distribution of t as ν tends to infinity is the normal distribution with zero mean and unit variance. When ν is large interpolation in ν should be harmonic.

P	40	30	25	20	15	10	5	2·5	1	0·5	0·2	0·05
$\nu = 1$	0·3249	0·7265	1·0000	1·3764	1·963	3·078	6·314	12·71	31·82	63·66	318·3	636·6
2	0·2887	0·6172	0·8165	1·0607	1·386	1·886	2·920	4·303	6·965	9·925	22·33	31·60
3	0·2767	0·5844	0·7649	0·9785	1·250	1·638	2·353	3·182	4·541	5·841	10·21	12·92
4	0·2707	0·5686	0·7407	0·9410	1·190	1·533	2·132	2·776	3·747	4·604	7·173	8·610
5	0·2672	0·5594	0·7267	0·9195	1·156	1·476	2·015	2·571	3·365	4·032	5·893	6·869
6	0·2648	0·5534	0·7176	0·9057	1·134	1·440	1·943	2·447	3·143	3·707	5·208	5·959
7	0·2632	0·5491	0·7111	0·8960	1·119	1·415	1·895	2·365	2·998	3·499	4·785	5·408
8	0·2619	0·5459	0·7064	0·8889	1·108	1·397	1·860	2·306	2·896	3·355	4·501	5·041
9	0·2610	0·5435	0·7027	0·8834	1·100	1·383	1·833	2·262	2·821	3·250	4·297	4·781
10	0·2602	0·5415	0·6998	0·8791	1·093	1·372	1·812	2·228	2·764	3·169	4·144	4·587
11	0·2596	0·5399	0·6974	0·8755	1·088	1·363	1·796	2·201	2·718	3·106	4·025	4·437
12	0·2590	0·5386	0·6955	0·8726	1·083	1·356	1·782	2·179	2·681	3·055	3·930	4·318
13	0·2586	0·5375	0·6938	0·8702	1·079	1·350	1·771	2·160	2·650	3·012	3·852	4·221
14	0·2582	0·5366	0·6924	0·8681	1·076	1·345	1·761	2·145	2·624	2·977	3·787	4·140
15	0·2579	0·5357	0·6912	0·8662	1·074	1·341	1·753	2·131	2·602	2·947	3·733	4·073
16	0·2576	0·5350	0·6901	0·8647	1·071	1·337	1·746	2·120	2·583	2·921	3·686	4·015
17	0·2573	0·5344	0·6892	0·8633	1·069	1·333	1·740	2·110	2·567	2·898	3·646	3·965
18	0·2571	0·5338	0·6884	0·8620	1·067	1·330	1·734	2·101	2·552	2·878	3·610	3·922
19	0·2569	0·5333	0·6876	0·8610	1·066	1·328	1·729	2·093	2·539	2·861	3·579	3·883
20	0·2567	0·5329	0·6870	0·8600	1·064	1·325	1·725	2·086	2·528	2·845	3·552	3·850
21	0·2566	0·5325	0·6864	0·8591	1·063	1·323	1·721	2·080	2·518	2·831	3·527	3·819
22	0·2564	0·5321	0·6858	0·8583	1·061	1·321	1·717	2·074	2·508	2·819	3·505	3·792
23	0·2563	0·5317	0·6853	0·8575	1·060	1·319	1·714	2·069	2·500	2·807	3·485	3·768
24	0·2562	0·5314	0·6848	0·8569	1·059	1·318	1·711	2·064	2·492	2·797	3·467	3·745
25	0·2561	0·5312	0·6844	0·8562	1·058	1·316	1·708	2·060	2·485	2·787	3·450	3·725
26	0·2560	0·5309	0·6840	0·8557	1·058	1·315	1·706	2·056	2·479	2·779	3·435	3·707
27	0·2559	0·5306	0·6837	0·8551	1·057	1·314	1·703	2·052	2·473	2·771	3·421	3·690
28	0·2558	0·5304	0·6834	0·8546	1·056	1·313	1·701	2·048	2·467	2·763	3·408	3·674
29	0·2557	0·5302	0·6830	0·8542	1·055	1·311	1·699	2·045	2·462	2·756	3·396	3·659
30	0·2556	0·5300	0·6828	0·8538	1·055	1·310	1·697	2·042	2·457	2·750	3·385	3·646
32	0·2555	0·5297	0·6822	0·8530	1·054	1·309	1·694	2·037	2·449	2·738	3·365	3·622
34	0·2553	0·5294	0·6818	0·8523	1·052	1·307	1·691	2·032	2·441	2·728	3·348	3·601
36	0·2552	0·5291	0·6814	0·8517	1·052	1·306	1·688	2·028	2·434	2·719	3·333	3·582
38	0·2551	0·5288	0·6810	0·8512	1·051	1·304	1·686	2·024	2·429	2·712	3·319	3·566
40	0·2550	0·5286	0·6807	0·8507	1·050	1·303	1·684	2·021	2·423	2·704	3·307	3·551
50	0·2547	0·5278	0·6794	0·8489	1·047	1·299	1·676	2·009	2·403	2·678	3·261	3·496
60	0·2545	0·5272	0·6786	0·8477	1·045	1·296	1·671	2·000	2·390	2·660	3·232	3·460
120	0·2539	0·5258	0·6765	0·8446	1·041	1·289	1·658	1·980	2·358	2·617	3·160	3·373
∞	0·2533	0·5244	0·6745	0·8416	1·036	1·282	1·645	1·960	2·326	2·576	3·090	3·291

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